

## Spin-Resolved Spectroscopy of the Yu-Shiba-Rusinov States of Individual Atoms

Saurabh Pradhan, Uppsala University

A magnetic atom in a superconducting host induces so-called Yu-Shiba-Rusinov (YSR) bound states inside the superconducting energy gap. By combining spin-resolved scanning tunneling spectroscopy with simulations we demonstrate that the pair of peaks associated with the YSR states of an individual Fe atom coupled to an oxygen-reconstructed Ta surface gets spin polarized in an external magnetic field. As theoretically predicted, the electron and hole parts of the YSR states have opposite signs of spin polarizations which keep their spin character when crossing the Fermi level through the quantum phase transition. The simulation of a YSR state right at the Fermi level reveals zero spin polarization which can be used to distinguish such states from Majorana zero modes in chains of YSR atoms.